## FIG.1A Amino Acid Sequence of the Composite $HCV_{HC-J1/CDC/CHI}$

10 16 Met Ser Thr Ile Pro Lys Pro Gln Arg Lys Thr Lys Arg Asn Thr Asn Ang Ang Pro Glin Asp Val Lys Phe Pro Gly Gly Glin Ile Val Gly Gly Val Tyr Leu Leu Pro Ang Ang Gly Pro Ang Leu Gly Val Ang Ala Thr Arg Lys Thr Ser Glu Arg Ser Gln Pro Arg Gly Arg Arg Gln Pro Ite Pro Lys Val Arg Arg Pro Glu Gly Arg Thr Trp Ata Gln Pro Gly Tyr Pro Trp Pro Leu Tyr Gly Asn Glu Gly Cys Gly Trp Ala Gly Trp 97 Leu Leu Ser Pro Ang Gly Ser Ang Pro Ser Trp Gly Pro Thr Asp Pro Ang Ang Ang Sen Ang Ash Leu Gly Lys Val Ite Asp Thn Leu Thn Cys 113 Gly Phe Ala Asp Leu Met Gly Tyr I'le Pro Leu Val Gly Ala Pro Leu 129 Gly Gly Ala Ala Ang Ala Leu Ala His Gly Val Ang Val Leu Glu Asp Gly Val Ash Tyr Ala Thr Gly Ash Leu Pro Gly Cys Ser Phe Ser Ite 161 Phe Leu Leu Ala Leu Leu Sen-Cys Leu Thr Val Pro Ala Sen Ala Tyr Glin Val Ang Ash Sen Thr Gly Leu Tyr His Val Thr Ash Asp Cys Pro 193 Ash Ser Ser Ite Val Tyr Glu Ala His Asp Ala Ite Leu His Thr Pro 209 Gly Cys Val Pro Cys Val Ang Glu Gly Ash Val Sen Ang Cys The Val 225 Ala Met Thr Pro Thr Val Ala Thr Arg Asp Gly Lys Leu Pro Ala Thr Glin Leu Ang Ang His Ite Asp Leu Leu Val Ely Sen Ata Thin Leu Cys Ser Ala Leu Tyr Val Gly Asp Leu Cys Gly Ser Val Phe Leu Ite Gly 273 Glin Leu Phe Thr Phe Ser Pro Ang Ang His Trp Thr Thr Glin Giy Cys 289 Ash Cys Ser Ile Tyr Pro Gly His Ile Thr Gly His Ang Met Ala Trp 305 Asp Met Met Met Ash Tro Ser Pro Thr Ala Ala Leu Val Met Ala Gin Leu Leu Ang Ile Pro Gin Ala Ile Leu Asp Met Ile Ala Gly Ala His 337 Inp Gly Val Leu Ala Gly Ile Ala Tyr Phe Ser Met Val Gly Ash Inp Ala Lys Val Leu Val Val Leu Leu Leu Phe Ala Gly Val Asp Ala Glu 369 385 Thr Ite Val Ser Gly Gly Gin Ala Ala Arg Ala Met Ser Gly Leu Val Ser Leu Phe Thr Pro Gly Ala Lys Gln Asn Ile Gln Leu Ile Asn Thr 401 Asn Gly Ser Trp His Ile Asn Ser Thr Ala Leu Asn Cys Asn Glu Ser 417 Leu Asn Thr Gly Trp Leu Ala Gly Leu Ile Tyr Gln His Lys Phe Asn Ser Ser Gly Cys Pro Glu Arg Leu Ala Ser Cys Arg Pro Leu Thr Asp 449 Phe Asp Gln Gly Trp Gly Pro Ile Ser Tyr Ala Asn Gly Ser Gly Pro Asp Gln Ang Pro Tyr Cys Trp His Tyr Pro Pro Lys Pro Cys Gly Ile 481 497 Val Pro Ala Lys Ser Val Cys Gly Pro Val Tyr Cys Phe Thr Pro Ser Pro Val Val Val Gly Thr Thr Asp Arg Ser Gly Ala Pro Thr Tyr Ser 513 Trp Gly Glu Asn Asp Thr Asp Val Phe Val Leu Asn Asn Thr Arg Pro 529 Pro Leu Gly Asn Trp Phe Gly Cys Thr Trp Met Asn Ser Thr Gly Phe 545 Thr Lys Val Cys Gly Ala Pro Pro Cys Val Ile Gly Gly Ala Gly Asn Ash Thr Leu His Cys Pro Thr Asp Cys Phe Arg Lys His Pro Asp Ala Thr Tyr Ser Arg Cys Gly Ser Gly Pro Trp Ile Thr Pro Arg Cys Leu 593 Val Asp Tyr Pro Tyr Arg Leu Trp His Tyr Pro Cys Thr Ile Asn Tyr 609 Thr Ile Phe Lys Ile Arg Met Tyr Val Gly Gly Val Glu His Arg Leu Glu Ala Ala Cys Asn Trp Thr Arg Gly Glu Arg Cys Asp Leu Glu Asp Ang Asp Ang Ser Glu Leu Ser Pro Leu Leu Leu Thr Thr Gin Trp 657 Gln Val Leu Pro Cys Ser Phe Thr Thr Leu Pro Ala Leu Ser Thr Gly 673 Leu Ile His Leu His Gin Asn Ile Val Asp Val Gin Tyr Leu Tyr Gly Val Gly Ser Ser Ile Ala Ser Trp Ala Ile Lys Trp Glu Tyr Val Val

## FIG.1B

Leu Leu Phe Leu Leu Ala Asp Ala Arg Val Cys Ser Cys Leu Trp 721 Met Met Leu Leu Ile Sen Gin Ala Giu Ala Ala Leu Giu Asn Leu Val Ile Leu Asn Ala Ala Ser Leu Ala Gly Thr His Gly Leu Val Ser Phe 753 Leu Val Phe Phe Cys Phe Ala Trp Tyr Leu Lys Gly Lys Trp Val Pro Gly Ala Val Tyr Thr Phe Tyr Giy Met Tro Pro Leu Leu Leu Leu Leu 785 Leu Ala Leu Pro Gln Arg Ala Tyr Ala Leu Asp Thr Glu Val Ala Ala 801 Ser Cys Gly Gly Val Val Leu Val Gly Leu Met Ala Leu Thr Leu Ser 817 Pro Tyr Tyr Lys Arg Tyr Ile Ser Trp Cys Leu Trp Trp Leu Gin Tyr 833 Phe Leu Thr Ang Val Glu Ala Gln Leu His Val Trp Ile Pro Pro Leu Ash Val Ang Gly Gly Ang Asa Ala Val Ile Leu Leu Met Cys Ala Val 865 His Pro Thr Leu Val Phe Asp Ite Thr Lys Leu Leu Leu Ala Val Phe Gly Pro Leu Trp Ile Leu Aso Ala Ser Leu Leu Lys Val Pro Tyr Phe 897 Val Ang Val Gin Gly Leu Leu Ang Phe Cys Ala Leu Ala Ang Lýs Met 913 Ile Gly Gly His Tyn Val G n Met Wal Fe Ile Lys Leu Gly Ala Leu 929 Thr Glý Thr Tyr Val Tyr Ash His Leu Thr Pro Leu Ang Asp Trp Ala 945 961 His Ash Gly Leu Ang Aso Leu Ala Val Ala Val Glu Pro Val Val Phe Ser Gln Met Glu Thr Lys Leu Ile Thr Tho Gly Ala Asp Thr Ald Ala 977 Cys Gly Asp Ile Ile Ash Gry Leu Pro Val Ser Ala Ang Ang Gly Ang 993 Giu Ile Leu Leu Gly Pho Ala Asp Gly Met Val Sen Lys Gly Tro Ang 1009 Leu Leu Ala Pro Ile Thr Ala Tyr Ala Gin Gin Thr Ang Gly Leu Leu 1025 Gly Cys Ile Ile Thr Ser Leu Thr Gly Ang Asp Lys Ash Glh Val Glu 1041 Glý Glu Val Gln Ile Va Sen Thr Alá Alá Gln Thr Phe Leu Ala Thr Cys Ile Ash Gly Val Cys Trp Thr Val Tyr His Gly Ala Gly Thr Ang 1073 Thr Ile Ala Ser Pro Lys Bly Pro Val Ile Gln Met Tyr Thr Asn Val 1089 Asp Gln Asp Leu Va! Giy Trp Pro Ala Pro Gln Gly Sér Ang Ser Leu 1105 The Pro Cys The Cys Gly See See Asp Leu Tyr Leu Val The Ang His 1121 Ala Asp Val Ite Pro Val Arg Arg Gly Asp Ser Arg Gly Ser Leu 1137 Leu Ser Pro Ang Pro Ile Ser Tyr Leu Lys Gly Ser Ser Gly Gly Pro 1153 Leu Leu Cys Pro Ala Gly His Ala Val Gly Ile Phe Ang Ala Ala Val 1169 Cys Thr Ang Gly Val Ala Lys Ala Val Asp Phe Ile Pro Val Glu Asn 1185 Leu Glu Thr Thr Met Arg Ser Pro Val Phe Trp Asp Asn Ser Ser Pro Pro Val Val Pro Gln Ser Phe Gln Val Ala His Leu His Ala Pro Thr 1217 Gly Ser Gly Lys Ser Thr Lys Val Pro Ala Ala Tyr Ala Ala Gin Gly 1233 Tyr Lys Val Leu Val Leu Asn Pro Ser Val Ala Ala Thr Leu Gly Phe 1249 Gly Ala Tyr Met Ser Lys Ala His Gly Ile Asp Pro Asn Ile Arg Thr 1265 Gly Val Ang Thr Ile Thr Thr Gly Ser Pro Ile Thr Tyr Ser Thr Tyr 1281 Gly Lys Phe Leu Ala Asp Gly Gly Cys Ser Gly Gly Ala Tyr Asp Ile 1297 Ile Ile Cys Asp Glu Cys His Ser Thr Asp Ala Thr Ser Ile Leu Gly 1313 Ile Gly Thr Val Leu Asp Gin Ala Glu Thr Ala Gly Ala Arg Leu Val 1329 1345 Val Leu Ala Thr Ala Thr Pro Pro Gly Ser Val Thr Val Pro His Pro Asn Ite Glu Glu Val Ala Leu Ser Thr Thr Gly Glu Ite Pro Phe Tyr 1361 Gly Lys Ala Ile Pro Leu Glu Val Ile Lys Gly Gly Arg His Leu Ile 1377 Phe Cys His Ser Lys Lys Cys Asp Giu Leu Ala Ala Lys Leu Val 1393 Ala Leu Gly Ile Asr Ala Val Ala Tyr Tyr Arg Gly Leu Asp Val Ser 1409 Val Ile Pro Thr Ser Gly Asp Val Val Val Val Ala Thr Asp Ala Leu

## FIG.1C

Met Thr Gly Tyr Thr Gly Asp Phe Asp Ser Val Ile Asp Cys Asn Thr Cys Val Thr Gin Thr Val Asp Phe Ser Leu Asp Pro Thr Phe Thr Ite Glu Thr I le Thr Leu Pro Gln Asp Ala Val Ser Arg Thr Gln Arg Arg Gly Arg Thr Gly Arg Gly Lys Pro Gly Ile Tyr Arg Phe Val Ala Pro Gly Glu Ang Pro Ser Gly Met Phe Aso Ser Ser Val Leu Cys Glu Cys 1505 Tyr Asp Ala Gly Cys Ala Trp Tyr Glu Leu Thr Pro Ala Glu Thr Thr Val Ang Leu Ang Ala Tyr Met Asn Thr Pro Gly Leu Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Gly Val Phe Thr Gly Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr Lys Gly Ser Gly Glu Asn Leu Pro 1569 Tyr Leu Val Ala Tyr Gin Ala Thr Val Cys Ala Arg Ala Gin Ala Pro Pro Pro Ser Trp Asp Gln Met Tro Lys Cys Leu Ile Ang Leu Lys Pro 1601 The Leu His Gly Pro The Pro Leu Leu Tyr Ang Leu Gly Ala Val Gin Ash Glu Ile The Leu The His Pro Val The Lys Tyr Ile Met The Cys 1633 Met Ser Ala Asp Leu Glu Val Val Thr Ser Thr Tro Val Leu Val Gly 1649 Gly Val Leu Ala Ala Leu Ala A a Tyr Cys Leu Ser Thr Gly Cys Val 1665 Val Ile Val Gly Ang Val Val Leu Sen Gly Lys Pro Ala Ile Ile Pro 1681 Asp Ang Glu Val Leu Tyr Ang Glu Phe Asp Glu Met Glu Glu Cys Ser 1697 Gin His Leu Pro Tyr Ile Giu Gin Gly Met Met Leu Ala Giu Gin Phe 1713 Lys Gln Lys Ala Leu Gly Leu Leu Gin Thr Ala Ser Arg Gln Ala Glu Val Ile Ala Pro Ala Val Gin Thr Asn Trp Gin Lys Leu Glu Thr Phe 1745 Trp Ala Lys His Met Trp Asn Phe Ile Ser Gly Ile Gln Tyr Leu Ala 1761 Gly Leu Ser Thr Leu Pro Gly Asn Pro Ala Ile Ala Ser Leu Met Ala 1777 Phe Thr Ala Ala Val Thr Ser Pro Leu Thr Thr Ser Gln Thr Leu Leu 1793 Phe Asn Ile Leu Gly Gly Trp Val Ala Ala Gln Leu Ala Ala Pro Gly 1809 Ala Ala Thr Ala Phe Val Gly Ala Gly Leu Ala Gly Ala Ala Ile Gly 1825 Ser Val Gly Leu Gly Lys Val Leu Ile Asp Ile Leu Ala Gly Tyr Gly 1841 Ala Gly Val Ala Gly Ala Leu Val Ala Phe Lys Ile Met Ser Gly Glu 1857 Val Pro Ser Thr Glu Asp Leu Val Asn Leu Leu Pro Ala Ile Leu Ser 1873 Pro Gly Ala Leu Val Val Gly Va! Val Cys Ala Ala Ile Leu Arg Arg 1889 His Val Gly Pro Gly Glu Gly Ala Val Gin Trp Met Asn Arg Leu Ile 1921 Ala Phe Ala Ser Ang Gly Asn His Val Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val Thr Ala Ile Leu Ser Ser Leu Thr 1937 Val Thr Glin Leu Leu Arg Arg Leu His Glin Trp Ile Ser Ser Glu Cys 1953 Thr Thr Pro Cys Ser Gly Ser Trp Leu Arg Asp Ile Trp Asp Trp Ile 1969 Cys Glu Val Leu Ser Asp Phe Lys Thr Trp Leu Lys Ala Lys Leu Met Pro Gln Leu Pro Gly Ile Pro Phe Val Ser Cys Gln Arg Gly Tyr Lys 2001 Gly Val Trp Arg Val Asp Gly Ile Met His Thr Arg Cys His Cys Gly 2017 Ala Glu Ile Thr Gly His Val Lys Asn Gly Thr Met Arg Ile Val Gly **2033** 2049 Pro Arg Thr Cys Arg Asn Met Trp Ser Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Arg Leu Pro Ala Pro Asn Tyr Thr Phe 2065 Ala Leu Trp Arg Val Ser Ala Glu Glu Tyr Val Glu Ile Arg Gln Val 1805 Gly Asp Phe His Tyr Val Thr Gly Met Thr Thr Asp Asn Leu Lys Cys 2097 Pro Cys Gln Val Pro Ser Pro Glu Phe Phe Thr Glu Leu Asp Gly Val 2113 Ang Leu His Ang Phe Ala Pro Pro Cys Lys Pro Leu Leu Ang Glu Glu 2129 Val Ser Phe Arg Val Gly Leu His Glu Tyr Pro Val Gly Ser Gln Leu 2145

## FIG.1D

2161 Pro Cys Giu Pro Giu Pro Asp Val Aia Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Ala Ala Gly Arg Arg Leu Ala Arg 2193 Gly Ser Pro Pro Ser Val Ala Ser Ser Ser Ala Ser Glin Leu Ser Ala 2209 Pro Ser Leu Lys Ala Thr Cys Thr Ala Ash His Asp Ser Pro Asp Ala 2225 Glu Leu Ile Glu Ala Asr Leu Leu Trp Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Giu Ser Glu Asn Lys Val Val Ile Leu Asp Ser Phe Asp Pro Leu Val Ala Glu Glu Asp Glu Arg Glu Ile Ser Val Pro Ala 2257 2273 Glu Ile Leu Ang Lys Sen Ang Ang Phe Ala Gln Ala Leu Pro Val Inp Ala Ang Pro Asp Tyr Asn Pro Pro Leu Val Glu Thr Trp Lys Lys Pro 2299 Asp Tyr Glu Pro Pro Val Val His Gly Cys Pro Leu Pro Pro Pro Lys 2305 2321 Ser Pro Pro Val Pro Pro Pro Arg Lys Lys Arg Thr Val Val Leu Thr Glu Ser Thr Leu Ser Thr Ala Leu Ala Glu Leu Ala Thr Arg Ser Phe 2337 Gly Sen Sen Sen Thr Sen Gly Ile Thr Gly Asp Asn Thr Thr Ihr Sen 2353 Ser Glu Pro Ala Pro Ser Gly Cys Pro Pro Asp Ser Asp Ala Glu Ser 2363 Fyr Ser Ser Met Pro Pro Leu Glu Gly Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser Gen Glu Ala Ash Ala Glu Asp 2401 2417 Val Val Cys Cys Ser Met Ser Tyr Ser Ins Thr Elv Ala Cys Val Thr Pro Cys Ala Ala Glu Glu Gir Lys Leu Pro Ile Ash Ala Leu Ser Ash 2433 Ser Leu Leu Ang His His Ash Leu Yol Tyn Sen Thr Thr Sen Ang Sen 2449 2465 Ala Cys Gin Ang Gin Lys Lys Val Thr Phe Asp And Leu Gin Val Leu Asp Ser His Tyr Gin Asp You Leu Lys Glu Val Lys Ala Ala Ala Ser 2481 Lys Val Lys Ala Asn Leu Leu Ser Val Glu Glu Ala Cys Ser Leu Thr Pro Pro His Ser Ala Lys Ser Lys Phe Gly Tyr Gly Ala Lys Asp Val 2513 2529 Ang Cys His Ala Ang Lys Ala Val Thr His Ile Ash Ser Val Trp Lys 2545 Asp Leu Leu Glu Asp Ash Val Thr Pro Ile Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gin Pro Glu Lys Gly Gly Ang Lys Pro Ala Ang Leu Ile Val Phe Fno Asp Leu Sty Val Ang Val Cys Glu Lys 2577 Met Ala Leu Tyr Asp Val Val Thr Lys Leu Pro Leu Ala Val Met Gly 2593 Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly Gln Arg Val Glu Phe Leu 2609 Val Gln Ala Trp Lys Ser Lys Lys Thr Pro Met Gly Phe Ser Tyr Asp 2625 Thr Ang Cys Phe Asp Ser Thr Val Thr Glu Ser Asp Ile Ang Thr Glu 2641 2657 Glu Ala Ile Tyr Gln Cys Cys Asp Leu Asp Pro Gin Ala Arg Val Ala Ile Lys Ser Leu Thr Glu Arg Leu Tyr Val Gly Gly Pro Leu Thr Asn Ser Ang Gly Glu Asn Cys Gly Tyr Ang Ang Cys Ang Ala Ser Gly Val 2689 2705 Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr Cys Tyr Ile Lys Ala Arg Ala Ala Cys Ang Ala Ala Gly Leu Gln Asp Cys Thr Met Leu Val Cys 2721 Gly Asp Asp Leu Val Val Ile Cys Glu Ser Ala Gly Val Gin Glu Asp 2737 2753 Ala Ala Ser Leu Arg Ala Phe Thr Glu Ala Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Gln Pro Glu Tyr Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala His Asp Gly Ala Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr Pro Leu Ala Arg Ala Ala 2801 Trp Glu Thr Ala Arg His Thr Pro Val Asn Ser Trp Leu Gly Asn Ile 2917 Ile Met Phe Ala Pro Thr Leu Trp Ala Arg Met Ile Leu Met Thr His 2849 Phe Phe Ser Val Leu Ile Ala Arg Asp Glin Leu Glu Glin Ala Leu Asp 2865 Cys Glu Ile Tyr Gly Ala Cys Tyr Ser Ile Glu Pro Leu Aso Leu Pro 298! Pro Ile Ile Gln Arg Leu Gly Cys Pro Glu Arg Leu Ala Ser

Antibody binding to individual peptides and various mixtures in an ELISA assay.







